

Low Birth Weight

Definition: Newborn birth weight less than 2,500 grams (5 lbs. 8 oz.). Low birth weight infants are either preterm infants (born at less than 37 weeks gestation) or full-term infants (born at 37 or more weeks gestation) that have inadequate fetal growth for gestational age (also known as intrauterine growth retardation).

Summary

In 1994, 4,083 infants were born in Washington weighing less than 2500 grams, representing 5.3 percent of all births. Low birth weight infants consist of two major groups: those who experience normal growth but are born too early (preterm) and those who are born at term but have inadequate fetal growth (intrauterine growth retardation).

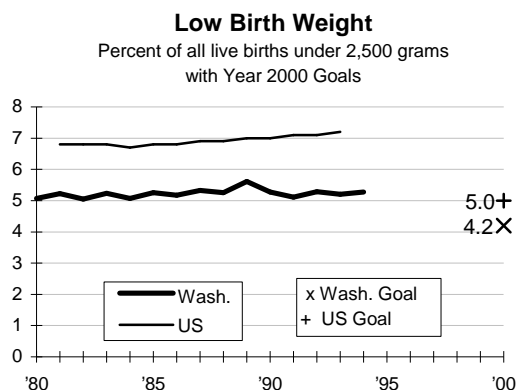
Low birth weight is a major contributor to infant mortality and morbidity. There are racial and social class disparities in the occurrence of low birth weight deliveries.

Time Trends

The rate of low birth weight in Washington has been relatively stable since 1980. It increased gradually from 5.1 percent in 1980 to 5.6 percent in 1989, mirroring a national trend, but dropped to 5.1 in 1991. Since that time, Washington's low birth weight rate has stabilized around 5.3 percent while the national rate has continued to rise.

Year 2000 Goal

Washington's goal for the year 2000 is a low birth weight rate of 4.2 percent. Given that the low birth weight rate was stable from 1980 through 1994 and that the slight decline observed from 1989 through 1991 has subsequently reversed, it appears unlikely this goal will be met.



Geographic Variation

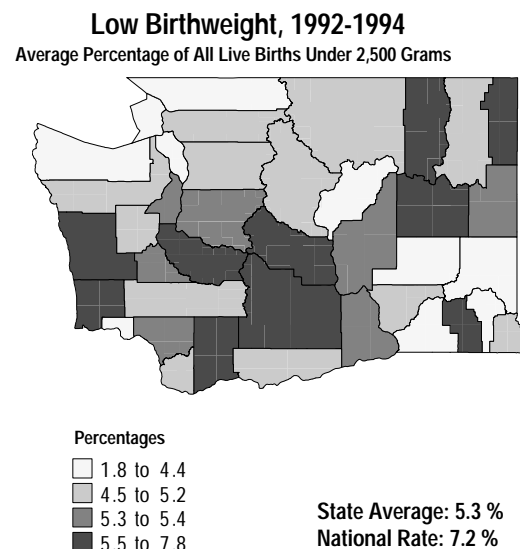
Washington's average annual low birth weight rate for 1992-1994 was 5.3 percent, which was lower than the national rate for that period.

From 1992-1994, average annual low birth weight rates at the county level ranged from 1.8 to 7.8 percent. The counties with the highest average annual rates were Skamania, Columbia, Pend Oreille, Pacific, Pierce, Lincoln, Ferry, and Kittitas. The counties with the lowest rates were Garfield, San Juan, Wahkiakum, Adams, Island, Clallam, Douglas, Walla Walla, Whatcom, and Whitman.

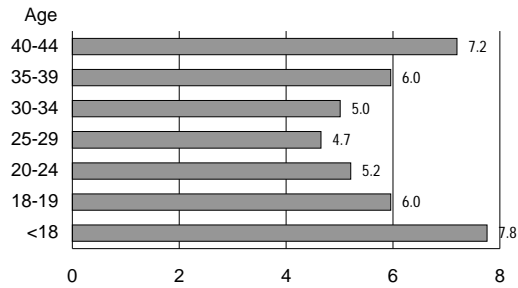
The counties with the highest rates are distributed throughout Washington except for the northwest region. There are high rates in both urban and rural counties.

Age and Gender

Mothers at the youngest and oldest ends of the childbearing age spectrum are at the greatest risk of having a low birth weight infant. (See chart on next page.)



Low Birth Weight
by Age of Mother at Time of Delivery
Percent of all live births, Wash., 1994

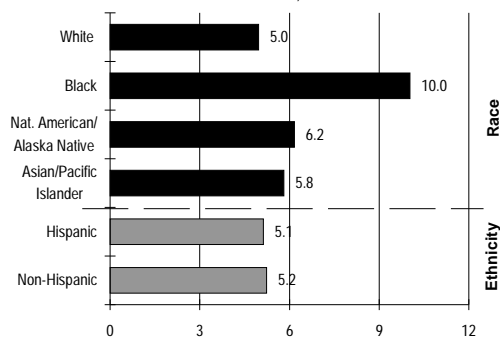


Race and Ethnicity

Over the last 15 years, African-Americans, Native Americans, and Asian/Pacific Islanders in Washington have experienced low birth weight deliveries at higher rates than whites. While the gaps have narrowed in recent years, particularly for African-Americans, they still persist.

Both in Washington and nationally, African-American women are twice as likely as white women to deliver a low birth weight infant. In 1994 in Washington, Native Americans and Asian/Pacific Islanders also had low birth weight rates that exceeded the rate for whites.¹ Infants of Hispanic ethnicity had a slightly lower rate of low birth weight than non-Hispanics.²

Low Birth Weight
by Race and Ethnicity
Percent of all Live Births
Wash. State, 1994



Income and Education

Lack of education is associated with low birth weight. In 1994, 6.5 percent of infants born to mothers without a high school degree were low birth weight compared to 4.2 percent born to mothers with some college education.

In 1994, 6.1 percent of infants born to Medicaid mothers were low birth weight, compared with 4.3 percent of infants born to mothers not on Medicaid.

Other Measures of Impact and Burden

Preterm Delivery. The birth of an infant before 37 weeks gestation is a predominant cause of low birth weight. Due to immaturity, preterm infants are more likely than term infants to experience respiratory distress, disease, infection, and other immediate life-threatening conditions. There are often significant difficulties in ascertaining when a delivery is preterm; the measurement issues are technical and lengthy.

Intrauterine Growth Retardation. Growth retarded infants are at heightened risk for neurological problems, severe mental retardation, lower respiratory tract conditions, and other problems. The risks may not be the same for all infants born small for gestational age; those born to small mothers may be at less risk. Better population-based measures of intrauterine growth retardation are needed that account for maternal stature and normal group-specific variations in birth weight.

Very Low Birth Weight. Very low birth weight is defined as less than 1,500 grams at birth. In 1994, there were 631 such infants born in Washington (0.8 percent of all live births). Infants this small are at greatest risk for death and long-term problems requiring more intense, costly medical care than appropriate weight infants.

Long Term Outcomes. Low birth weight is a major contributor to infant mortality and morbidity. In 1992, the mortality rate for low birth weight infants was 52/1,000 compared to a mortality rate of 7/1,000 among all infants. Advances in neonatal care systems have improved survival rates for very small infants, but these infants also have high rates of long term morbidity and developmental disability, often requiring ongoing medical intervention.^{1,2} Recent research suggests that low birth weight may create risk for attention deficit-hyperactivity disorder, and might signal the potential for future psychiatric problems.²

Costs. The costs of low birth weight include the costs of medical care, special education, early intervention, other support services, and additional costs to the family such as the time parents devote to care of sick babies. It has been estimated that, of

the \$11 billion spent on health care for infants today, approximately 35% (\$4 billion) is spent on the incremental costs of low birth weight infants, with nearly half of that going to rescue infants under 1500 grams or 3.3 pounds (\$1.8 billion).³

Risk and Protective Factors

Despite extensive research, the causes of low birth weight are still not well understood. There is, however, a large body of literature on risk and protective factors associated with low birth weight.

Pre-pregnancy Maternal Risk. Several risks for low birth weight predate the pregnancy. These factors include first pregnancy, fifth pregnancy or higher, low maternal weight for height, previous spontaneous abortion or preterm birth, diabetes, hypertension, nonimmune status for an infection such as rubella, and maternal genetic factors.

Pregnancy-Related Maternal Risk. Other risk factors include current pregnancy conditions such as multiple pregnancy, poor weight gain, anemia, hyperemesis, gestational diabetes, hypertension, and infection.⁴ Hypertension is the one medical factor clearly associated with less than normal uterine growth.⁵

Behavioral and Environmental Risks Low birth weight that results from less than normal uterine growth is associated with three major risk factors: cigarette smoking during pregnancy, low maternal weight gain, and low prepregnancy weight for height. These three factors account for nearly two thirds of all intrauterine growth retardation.⁶ Closely spaced pregnancy interval, poor nutritional status, smoking, heavy alcohol consumption, illicit drug use, and toxic exposures have been associated with the delivery of a low birth weight infant.⁷ Additionally, research suggests a correlation between battering and low birth weight when other factors were controlled. The percentage of battered women giving birth to low birth weight infants was twice that of non-battered women.⁸ It is not clear how the mother's socioeconomic status leads to low birth weight. Poverty, with its associated risk for reduced access to health care, poor nutrition, lower educational levels, inadequate housing, and greater physical and psychological stress, may be responsible for some of the increased risk for low birth weight.

Protective Factors. Early and continuous prenatal care is associated with improved birth outcomes. Specific to low birthweight, prenatal care that includes nutrition assessment and

education can increase nutrition status and increases weight gain and birth weight.⁵ Utilization of appropriate risk services improves clinical management of known medical risk factors, including genetic predispositions.

Preconception risk assessment and counseling can contribute to normal weight births by enabling life style choices (e.g., smoking cessation) and medical interventions (e.g., clinical management of diabetes) to occur prior to pregnancy.

High Risk Groups

Mother's Age. In Washington state, mothers under 18 and over 34 years of age have a higher risk of low birth weight. However, studies suggest that age is not an independent risk factor for low birth weight. Adolescent mothers come disproportionately from disadvantaged and minority populations. There are data to suggest that maternal age greater than 34 years only acts as a risk factor in the presence of other factors.^{7,9}

People of color: Most studies of low birth weight's association with race and ethnicity have found that African-American women have about twice the risk of low birth weight delivery as whites, with preterm delivery being the primary cause. Washington data also support this finding. A residual effect of African-American race on low birth weight remains even when socioeconomic and behavioral mediators such as income, education, and lifestyle habits are controlled. Besides social and economic factors, very few studies have examined medical or psychosocial risks of African-American women. More work is in progress.³

Women of low income and education: Studies show that rates of low birth weight increase with decreasing socioeconomic status. This association persists across various measures of economic status, including occupations of the mother and father, income, and education.³

Intervention Points, Strategies and Effectiveness

While the structure and content of prenatal care was not developed specifically to prevent low birth weight, data indicate that women who receive risk-appropriate prenatal care have fewer low birth weight babies.¹⁰ Prenatal care should include structured screening techniques to identify women with a history of or at risk for domestic violence, use of tobacco or alcohol, illicit drug use, and low

maternal weight for height.¹¹ Early identification provides clinicians with a greater opportunity to intervene. A perinatal regional system can sustain and improve the quality of medical care by assuring that proven, effective medical interventions are available and appropriately used.

High risk tracking systems help assure that infants receive necessary followup services.

Preconception intervention includes provision of information and counseling related to reproductive risks, health enhancing behaviors, and birth control options at every health care encounter with women of child bearing age.¹²

The federal Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides low income pregnant women with food vouchers, nutrition education and referrals to other services and has been shown to improve birth weights. Studies show that women participating in WIC consume more key nutrients of iron, protein, calcium and vitamin C.¹³ The General Accounting Office has estimated that in 1992 women who received WIC benefits had 25% fewer low weight births and 44% fewer very low birth weight infants than similar women who did not receive these benefits.¹⁴

Studies of the cost-effectiveness of smoking cessation interventions in pregnancy show that relatively small investments in these interventions can have large health benefits.¹⁵

Additional research could help us understand the causes of preterm labor and the differential in rates of low birth weight among racial and ethnic groups. This, in turn may enable us to identify more specific and effective prevention strategies.

Data Sources

State birth data: Washington Department of Health, Center for Health Statistics. Prepared by DOH MCH Assessment Section.

National birth data: "Advance Report of Final Natality Statistics, 1993," National Center for Health Statistics.

For More Information

Washington State Department of Health, Division of Community and Family Health, Maternal/Child Health Programs, (360) 753-5870.

Technical Notes

Race and ethnicity: see Appendix

Endnotes:

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⁴ Kiely JL, Brett KM, Rowley DL. Low birthweight. In: From data to action: CDC's public health surveillance for women, infants, and children. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1994;231-49.

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⁸ Bullock, L. and McFarlane, J. The Birthweight/Battering Connection. *American Journal of Nursing* September 1989. 1153-55.

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¹² Toward Improving the Outcome of Pregnancy, March of Dimes, 1993.

¹³ Rush, D. Evaluation of the Special Supplemental Food Program for Women, Infants, and Children. *American Journal of Clinical Nutrition Supplement* 1988; 48,2:512-19

¹⁴ Early Intervention: Federal investments like WIC can produce savings. U.S. General Accounting Office, GAO/HRD-92-18. Washington DC: GAO, 1992.

¹⁵ Marks, J. S., Koplan, J. P., Hogue, C.J.R. et al. A Cost-Benefit/Cost Effectiveness Analysis of Smoking Cessation for Pregnant Women. *American Journal of Preventive Medicine* 1990. 6:282-89
